All of the outstanding years of frost damage had a June mean temperature below 67°. In the order of rank, the worst 5 years were 1924, with only 33 percent not frosted; 1915, 35 percent; 1902, 48 percent; 1917, 49 percent; and 1912, 66 percent. There were 11 years with June mean temperature below 67°, and in 9 of these more that the average amount of corn was frosted.

RAININESS CHARTS OF THE UNITED STATES

By ERIC R. MILLER

[Weather Bureau, Madison, Wis.]

Raininess is the average rainfall per rainy day, rainy day being defined in turn as one with 0.01 inch or more of rain or melted snow.

The average raininess of the United States for the 4 seasons and for the year is shown on the 5 charts accompanying this paper. The data from A. J. Henry, climatology of the United States (Bulletin Q, U.S. Weather Bureau) of average rainfall and average number of rainy days, were employed in computing the raininess because they appear side by side in that publication.

Data from both regular and cooperative stations were worked up, but the results from the cooperative stations proved to be too inconsistent for use on the charts. This inconsistence results from the large variation in the number of rainy days recorded by cooperative observers to which I have previously drawn attention (M.W.R. 43, 1915, 275–278). The difference between cooperative and regular stations is greater in winter than in summer. The following table contains a few of the more extreme cases noted in preparing these maps.

Comparative raininess at regular and cooperative stations.

Station	Winter			Summer			Year		
	Rainfall	Rainy days	Raininess	Rainfall	Rainy days	Raininess	Rainfall	Rainy days	Raininess
Baltimore, Md	10.0	34	0.29	12.7	33	0.39	43.4	131	0.33
Darlington, Md	10.5	18	.58	12.0	23	.53	43.8	82	.54
Jupiter, Fla	9.3	28	.33	16.6	39	.43	58.7	134	.44
Miami, Fla	8.1	9	.90	20.6	22	.94	58.3	65	.90
San Luis Obispo	10.3	19	.54	.1	0	------	19.2	42	.46
Santa Barbara, Calif	10.0	11	.91	.1	1	.10	16.6	27	.61
Springfield, Ill	7.6	29	.26	10.0	28	.36	37.4	117	.32
Griggsville, Ill	6.3	15	.42	10.9	19	.58	37.0	73	.51
Duluth, Minn	3.3	32	.10	11.6	37	.33	29.9	133	.22
Mount Iron, Minn	2.9	12	.24	13.8	26	.53	33.3	74	.45
North Platte, Nebr	1.3	15	.09	8.1	26	.31	17.9	79	.23
Ansley, Nebr	1.8	9	.20	10.3	21	.49	23.0	57	.40
Abilene, Tex	3.4	14	.24	7.0	19	.37	24.5	66	.37
Menardville, Tex	3.3	6	.55	6.9	10	.69	22.6	35	.65

Comparison of the maps of raininess with the maps of precipitation and of number of rainy days in the Atlas of American Agriculture, part 2, section A, Precipitation and Humidity, by J. B. Kincer, shows that raininess is more uniformly distributed than rainfall. This results from the fact that rainfall and number of rainy days tend to vary together, so that the result of dividing one by the other shows less fluctuation. The mountain maxima of rainfall do not appear in the raininess charts.

The number of rainy days is relatively greater in the Northeastern States than in the Southern. Hence the gradient of raininess from the Gulf States to the Lake region is somewhat steeper than the gradient of rainfall.

The annual march of raininess varies from the interior toward the oceans. In the interior the raininess is smallest in winter, but is then largest on the Pacific slope. The North Atlantic States have relatively uniform raininess throughout the year, but in the Gulf States winter and spring exceed summer and autumn.

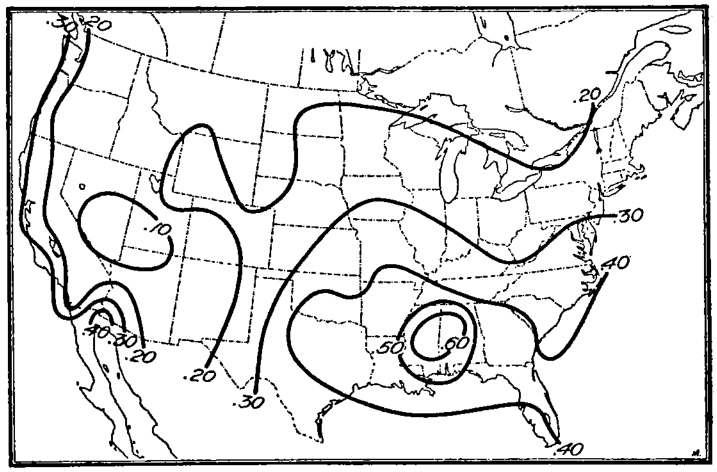

FIGURE 1.—Raininess chart of the United States—spring.

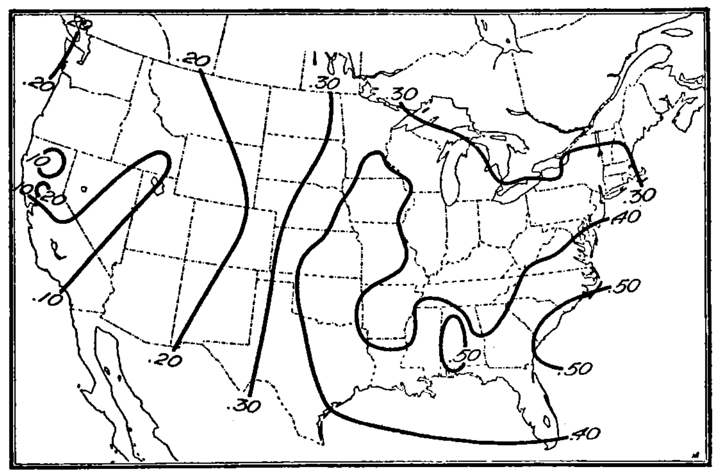

FIGURE 2.—Raininess chart of the United States—summer.

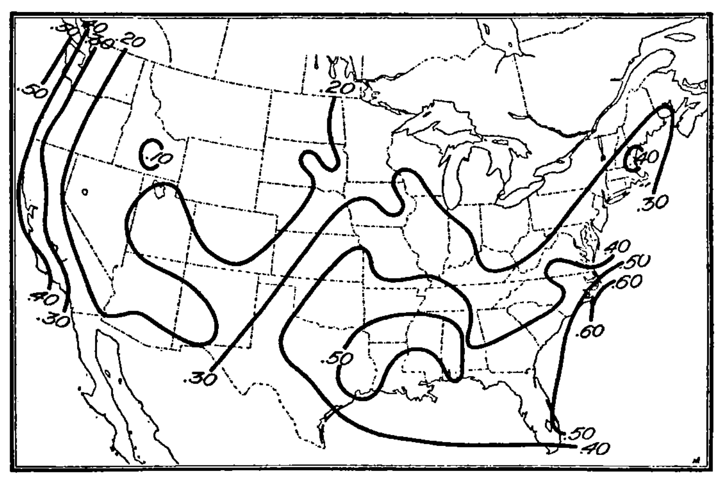

FIGURE 3.—Raininess chart of the Unitd States—autumn.

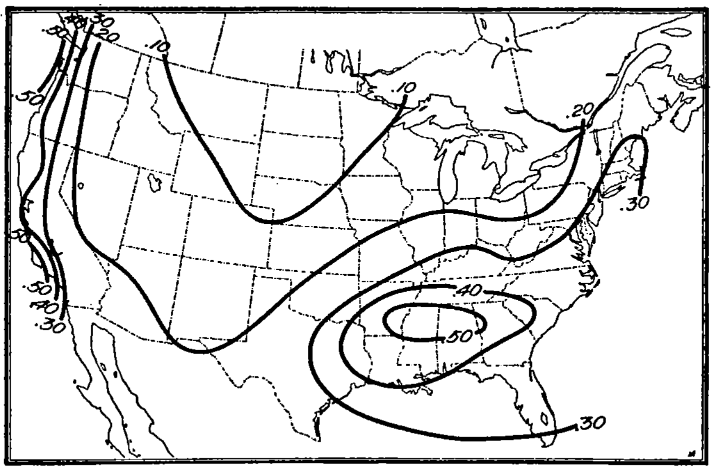

FIGURE 4.—Raininess chart of the United States—winter.

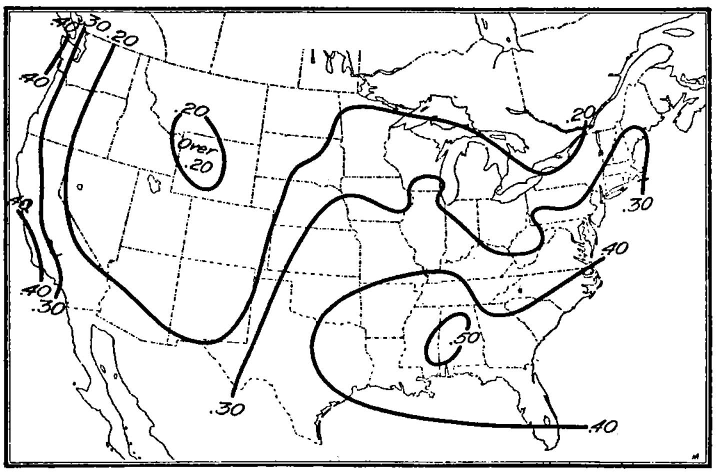

FIGURE 5.—Raininess chart of the United States—year.

The data used in charting the raininess end with the year 1903. In order to see if there has been any secular change, similar data have been taken out for five stations for the period ending with the year 1930. The results are given in the following table:

Comparative raininess

Station	To—	Winter	Spring	Summer	Autumn	Year
Boston	1903	0.32	0.32	0.34	0.37	0.34
	1930	.31	.31	.34	.36	.33
Chicago	1903	.19	.25	.35	.28	.27
	1930	.19	.25	.34	.29	.27
New Orleans	1903	.44	.55	.41	.43	.45
	1930	.46	.58	.43	.48	.47
Phoenix	1903	.25	.20	.16	.21	.20
	1930	.20	.25	.18	.24	.20
San Francisco	1903	.38	.25	.07	.31	.33
	1930	.40	.29	.06	.29	.33

THE ICE STORM OF DECEMBER 16–17, 1932, NEAR HIGHLANDS, N.C.

By L. T. PIERCE

[Weather Bureau office, Ashville, N.C.]

A glaze or ice storm of destructive severity visited several widely-separated localities in the North Carolina mountains on the night of December 16–17, 1932. Limbs and branches were stripped from forest and shade trees, and even trunks snapped off under the weight of the ice accumulations. The principal area of destruction extended from Highlands, N.C., northward along the Blue Ridge for a distance of 20 to 30 miles. Light glaze conditions prevailed over a much wider area, extending over the western half of the Carolinas, northern Georgia, eastern Tennessee, and probably into nearby States.

Apparently cold, northeast surface winds, moving nearly parallel to, but east of, the Blue Ridge were overrun by moist, warmer air from the south in which precipitation occurred in the form of rain that froze when it came into contact with the surface which previously had been cooled, by the northerly winds, to below the freezing point.

ORGANIZATION OF THE METEOROLOGICAL AND AEROLOGICAL SERVICES RELATIVE TO AVIATION IN CHILE

By JULIO BUSTOS NAVARRETE, Director

[Observatorio del Salto, Santiago, Chile, 1931]

Since 1927 aviation in Chile has relied on its own service to disseminate the meteorological and aerological information necessary to the navigation of the air.

In reality this service depends on three central observatories and numerous stations throughout the length of the land that make daily issues of weather information to the pilots.

The meteorological and aerological observatory at the aerial base Los Condores (Iquique) collects observations in the northern zone of Chile and transmits them daily, at 8 a.m. and 2 p.m., by radio to "El Bosque."

The meteorological and aerological observatory at the aerial base Maquehue (Temuco) collects observations in all of the southern zone and transmits them daily, at 8 a.m. and 2 p.m. to the station at "El Bosque."

The central meteorological office for aviation attached to the meteorological observatory at "El Bosque" collects, in its turn, all observations in the central zone.

As a result there are collected by radio at "El Bosque" at an early hour in the morning and at an early hour in the afternoon data on the state of the atmosphere throughout the country, with the observations necessary for the construction of meteorological charts relative to navigation of the air.

At each observatory records are made of atmospheric pressure, temperature, humidity, direction and force of the wind at the surface and also at different elevations, amount and classification of clouds, visibility, precipitation, and also of aerial soundings.

The instrumental equipment of the central observatories Los Condores, El Bosque, and Maquehue is very complete, including apparatus for direct reading and automatic registration. Furthermore, at El Bosque there is used for aerial soundings a Zeiss recording theodolite that traces in a diagram the direction and the velocity of the wind at different elevations.

Experiments are made with meteorographs installed on the planes of the Línea Aéria Nacional, and each pilot carries a route sheet on which are entered the meteorological conditions for each region of the country.